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WO 92/12035 A1 US 5222757 A US 4781396 A
US 4669743 A US 4401313 A US 4261596 A

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(54) Abstract Title
Collapsible wheelbarrow

(57) A collapsible wheelbarrow has a receptacle (2), a handle (8), a wheel (12) and support legs (10). The receptacle has a rigid base (4) and sides (6) defined by a collapsible framework such that the sides (4) can collapse against the base (4). The handle (8) and the support legs (10) are mounted on the framework and the wheel (12) is also mounted on the framework via a support frame (14). The handle (8), support frame (10) and wheel (12) and its support frame (14) are movable between extended positions, where the wheelbarrow is operable and retracted positions where the wheelbarrow is collapsed (see arrows A, B and C).

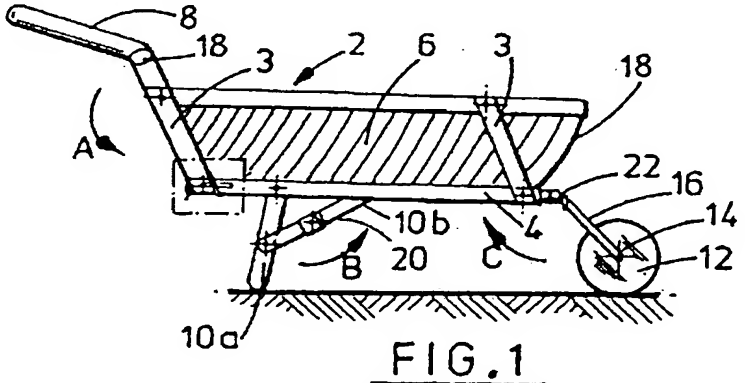


FIG.1

GB 2 339 741 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

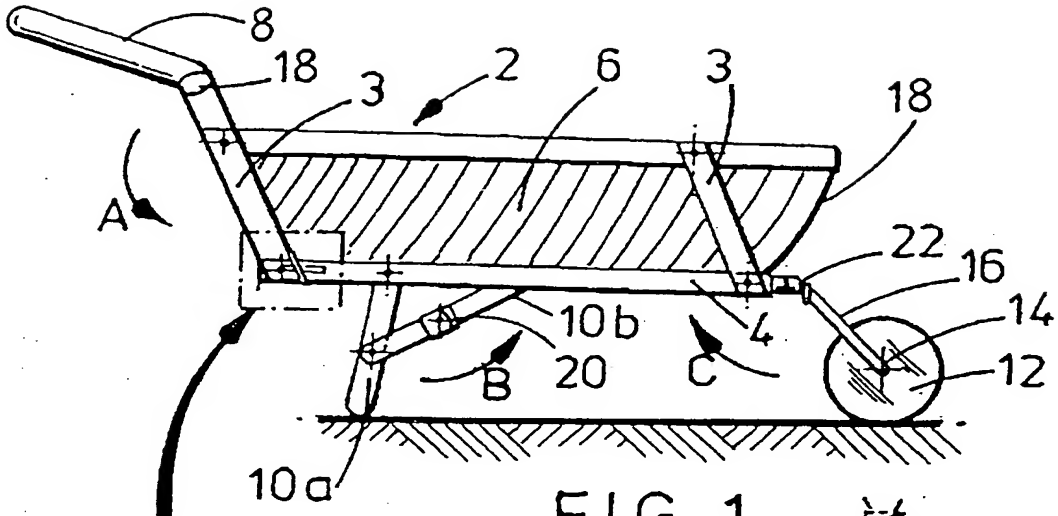


FIG.1

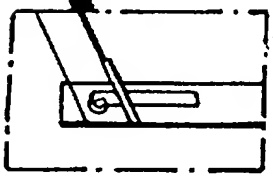


FIG.2

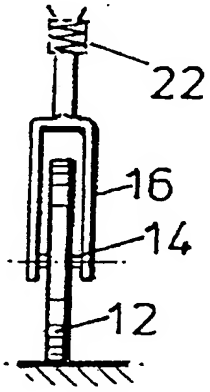


FIG.3

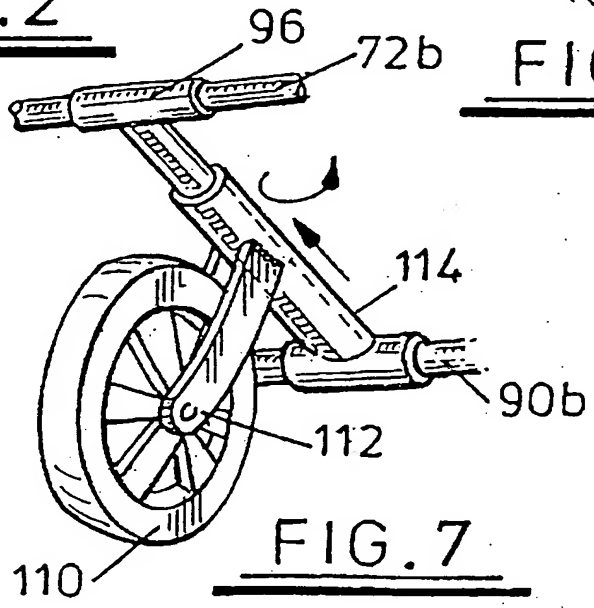
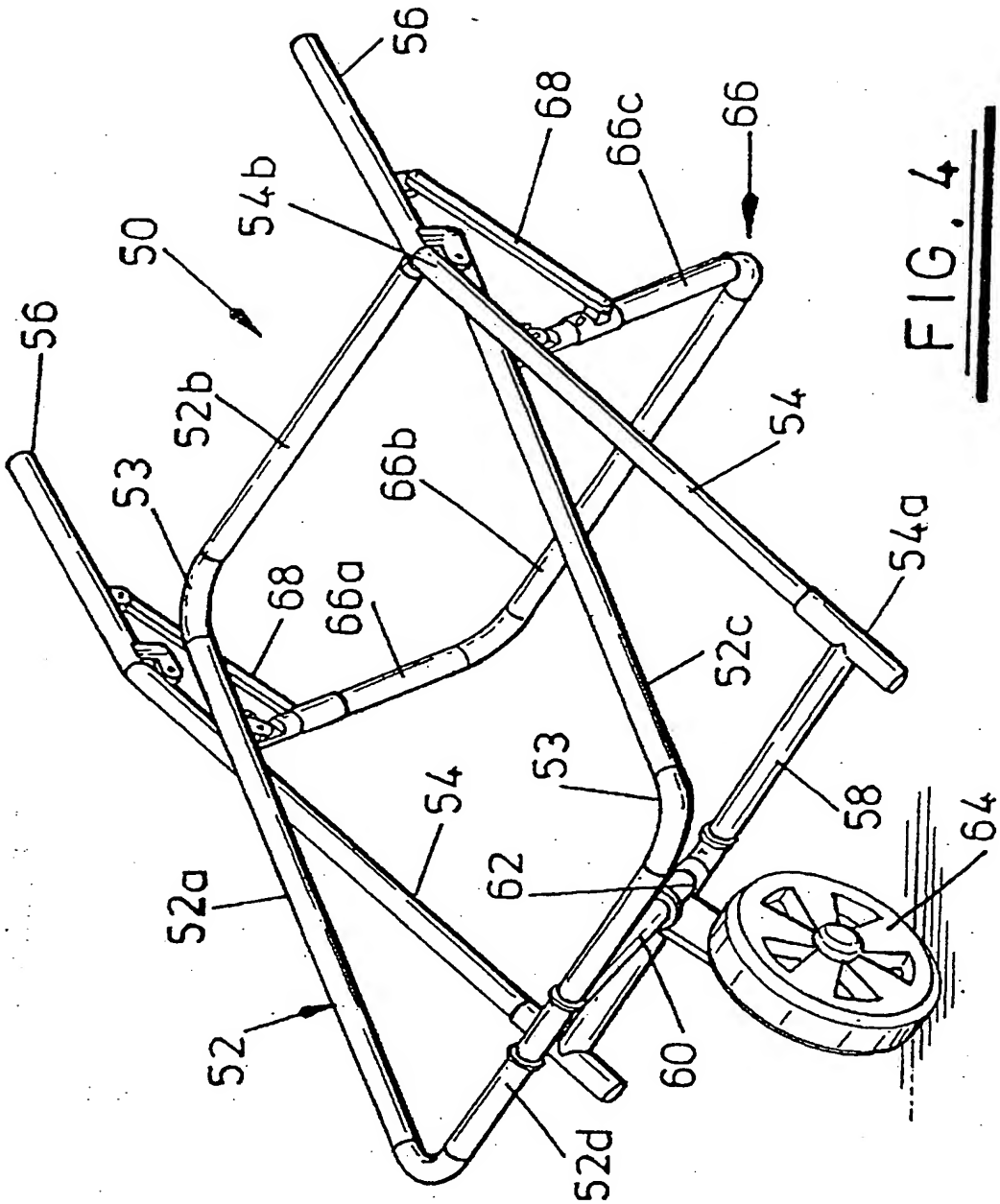


FIG.7


56
68
66c
66
54b
50
56
52b
54
53
66b
54a
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66a
52c
53
54
58
64
62
52a
52
60
52d

FIG. 4

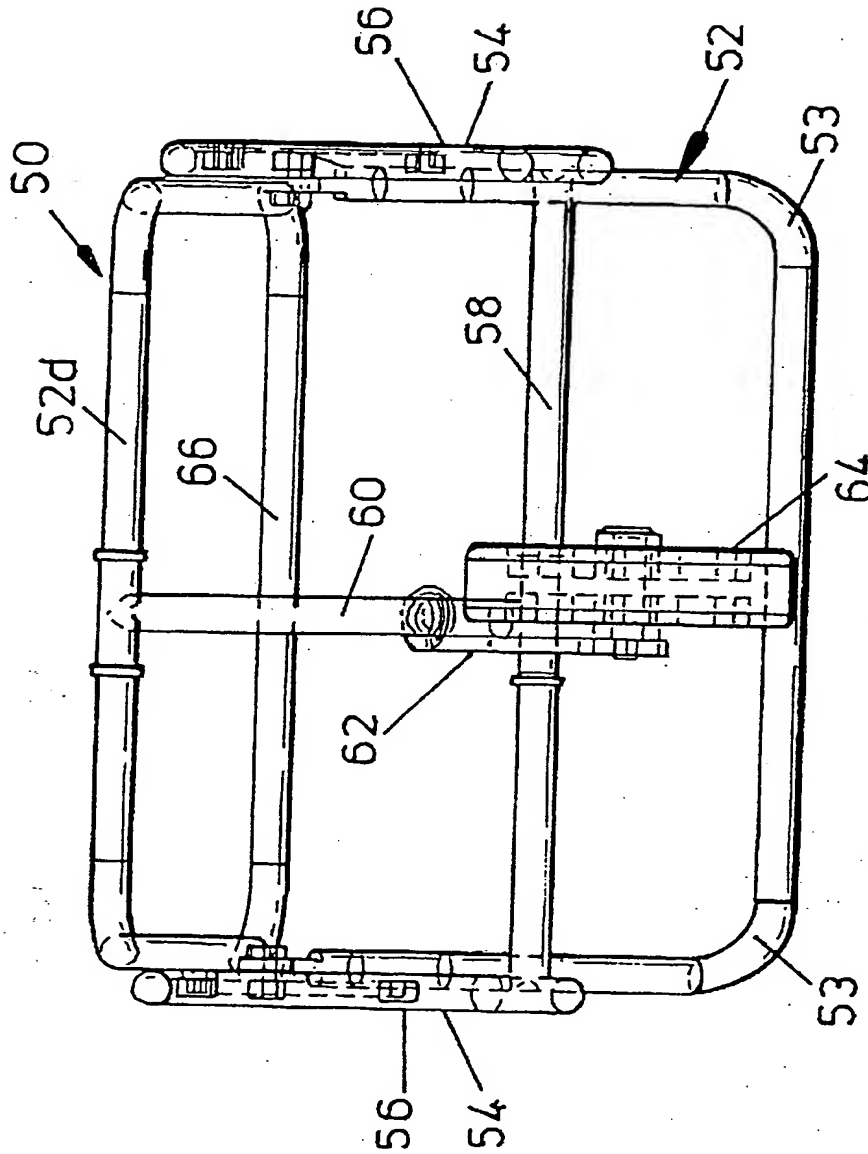

FIG. 5

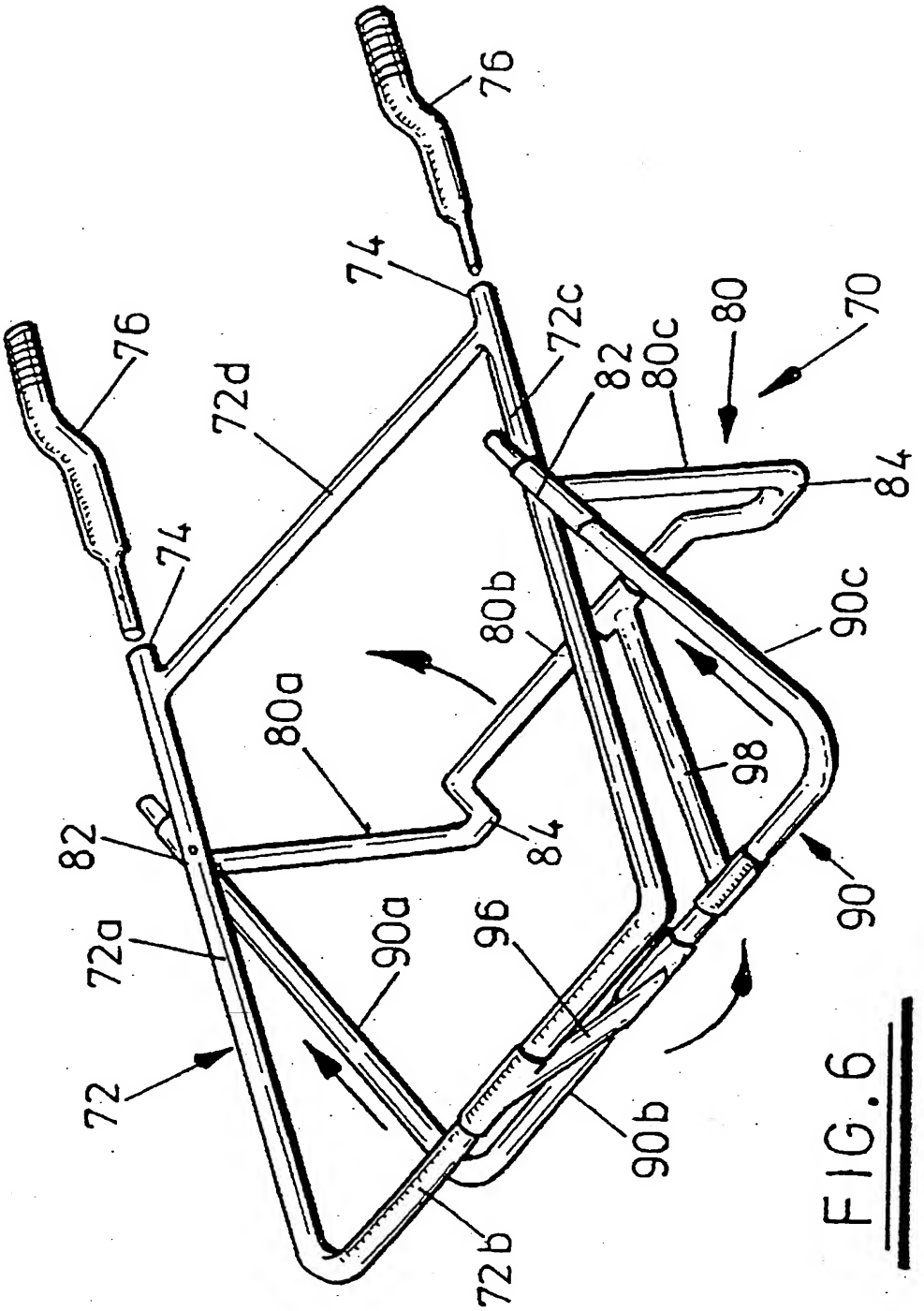
76
74
72c
82
80c
80
70
76
72d
74
84
80b
90c
80a
98
82
84
72a
90a
96
90
72
90b
72b

FIG. 6

2339741

Title: Improvements relating to wheelbarrows.

DESCRIPTION

The present invention relates to an improved wheelbarrow.

Wheelbarrows provide convenient means of carrying loads, particularly around gardens and on building sites. However, the construction of a wheelbarrow is such that, even when empty, it occupies a large volume of space and hence, this causes problems with its storage and transportation.

It is an object of the present invention to provide an improved wheelbarrow which aims to overcome the abovementioned drawbacks.

Accordingly, the present invention provides a wheelbarrow comprising a receptacle, a handle extending from said receptacle, a wheel and a support leg wherein at least one of said parts is movable between an operative and a non-operative position.

The receptacle for receiving a load comprises a base having sides extending upwardly therefrom. Preferably, the sides of the wheelbarrow are collapsible against the base thereof. Preferably, the base is a solid structure and the sides are made up of a framework of articulated members, being pivotally connected to each other to allow the sides to be flattened against the base of the barrow for storage purposes. Preferably, each member is pivotable over a limited range of degrees, the extremes of which correspond to the operative and non-operative positions of the members respectively. Each side may be formed from, for example, two members extending upwardly from one side of the base, preferably being substantially parallel

to each other, which are joined together at their upper end by a cross member. It is also preferable to provide means for locking the framework in the operative position, e.g., by the provision of a locking pin between two or more adjacent members. Preferably, the locking pin is provided across the joints of the members which meet at the corners of the rear of the receptacle.

Preferably, the upper members of the framework defining the top edges of the sides are longer in length than the lower members, thereby providing a receptacle with tapered sides.

The sides may be infilled by the provision of a fabric material between the members and base of the wheelbarrow. The fabric material allows the sides to be collapsed against the base. It is preferable to provide the fabric material with a waterproof coating.

Alternatively, and/or additionally each side may be infilled by a separate piece of rigid material, e.g a sheet of metal, or slats of cardboard or plastics material which may be fastened to the members, eg., by clips, a hook and eye type fastener of other suitable means. The sides may then be removed to enable the members to be flattened against the base.

Additionally, the sides of the receptacle may be provided with detachable extensions thereto, e.g. in the form of clip on sheets of material, for temporarily extending the volume of the receptacle.

It is to be appreciated that the base may also be formed as part of the framework, having a sheet of rigid material which may be inserted into the extended framework and supported thereby for forming the base of the receptacle. Alternatively, a collapsible box may be inserted in the framework for forming the receptacle. For example, the receptacle may be

formed from a flat sheet of plastics material having living hinges to allow assembly of the receptacle. The box or sheets of material for forming the base and/or sides of the receptacle may be provided with means for temporarily fastening them to the framework.

The handle is preferably movable between a non-operative and an operative position. Preferably, the handle is formed as an extension to the framework, being provided with a joint at or near the junction with the receptacle. Preferably, locking means is provided to lock the handle in the extended position. Alternatively, the handle may be detachable.

The wheel support frame of the barrow is preferably rotatably mounted to the base or front of the receptacle to allow the support frame to be folded inwardly towards the base. Preferably, the support frame is provided with a locking mechanism to lock the support frame in the extended position. It is preferable that the support frame is spring loaded with respect to the receptacle to allow the wheel to swivel and lie flat against the base in the non-operative position. Alternatively, the wheel and/or wheel support frame may be detachable for storage purposes.

Preferably, the support leg is formed as part of the framework, comprising a member which is pivotably attached to the base or a part of the framework. Preferably, a crossbar is provided substantially diagonally between the support leg and the receptacle. The crossbar is preferably formed of two parts, being pivotally mounted with respect to each other and having means for temporarily locking the two parts in one plane, such as a ring for positioning over the joint of the parts, or a locking pin. Removal of the ring from over the joint allows the parts to be bent and thereby allows the leg to be folded inwardly towards the base of the receptacle.

One or more, preferably two, support legs may be provided, optionally with wheels at the free end thereof. The wheels may be detachable from the leg, e.g. by means of a clip-type fastening. Alternatively, the support leg(s) may be detachable for storage purposes.

In alternative embodiments of the present invention, the wheelbarrow may be provided with a framework for receiving the receptacle, a support leg and an attachment for a wheel, the parts being movable with respect to each other between the operative and non-operative positions. The support leg is preferably generally U-shaped comprising parallel side members joined by a base member, the free ends of each member being, for example hingedly mounted or pivotably attached, to the framework.

The attachment for the wheel is preferably pivotally or hingedly mounted to the front of the framework. More preferably, the attachment is in the form of a generally U-shaped member, the base of the member having a crossbar mounted thereon for attachment of the wheel, the crossbar being pivotally or hingedly mounted with respect to said framework.

Preferably, the wheelbarrow is comprised of the aforementioned parts which are all movable between their respective operative and non-operative positions, or a combination of parts some of which are movable whilst others are detachable, such as a detachable handle, wheel and legs mounted to an articulated framework thereby providing a wheelbarrow which may be flattened for easy storage and transportation.

The parts of the wheelbarrow may be made of any suitable material. For example, the framework may be made of wood or a plastics material. The sides and/or base may alternatively be made of a reinforced cardboard.

For a better understanding of the present invention and to show more clearly how it may be carried into effect, reference will now be made by way of example only to the accompanying drawings in which:-

Figure 1 is a schematic diagram of a wheelbarrow according to one embodiment of the present invention;

Figure 2 is an exploded view of the boxed region of Figure 1;

Figure 3 is schematic diagram of the wheel and support frame of the wheelbarrow of Figure 1;

Figure 4 is a perspective view of the framework for a wheelbarrow according to another embodiment of the present invention, shown in the operative position;

Figure 5 is schematic diagram of the framework shown in Figure 4, in the non-operative position;

Figure 6 is a perspective view of a framework for a wheelbarrow according to a further embodiment of the present invention; and

Figure 7 is a perspective view of a wheel attachment for the wheelbarrow shown in Figure 6.

Figures 1 to 3 of the accompanying drawings illustrate a collapsible wheelbarrow according to one embodiment of the present invention. The wheelbarrow has a receptacle 2 for receiving loads having a rectangular base 4 and sides 6, a handle 8, two support legs 10 and a wheel 12 mounted on an axle 14 attached to a support frame 16. The base 4 is of solid substance, such as wood, cardboard, sheet metal or a plastics material and the sides 6 are

defined by a collapsible framework made of articulated rigid members 3 having a fabric material 18 extending from the base to the top of the framework thereby providing the receptacle 2.

The handle 8 is formed as an extension to the framework and is movable between an extended position and a retracted position (indicated by arrow A on Figure 1). The handle is locked in the extended position by the provision of a ring 18 which may encase the joint between the handle and the rest of the framework thereby preventing movement thereof.

The supporting legs 10 are each provided by a member 10a pivotally connected to the base 4. Each leg is movable between an extended and retracted position, as indicated by arrow B in Figure 1. A crossbar 10b extends substantially diagonally between the leg 10a and the base of the receptacle. The crossbar 10b is made of two parts which are pivotally mounted with respect to each other and have means for temporarily locking the two parts in the same plane, such as a ring 20, which maintains the leg in the extended position. Pushing the ring away from the joint of the two parts allows the parts to be bent thereby allowing the leg to be moved inwardly to the stored or non-operative position.

The wheel 12 is also mounted, via its support frame 14, to the framework and is movable between a stored and operative position. Additionally, the support frame of the wheel is spring-loaded 22 with respect to the framework to allow the wheel to be swiveled through approximately 180° to lie flat against the base of the wheelbarrow in the non-operative position.

The construction of the wheelbarrow allows it to be flattened for easy transportation

and storage. In the operative position, the components are locked in their extended position to allow normal use of the wheelbarrow. After use, the handle is moved downwards, the legs folded inwardly towards the base of the wheelbarrow, the sides are flattened such that the upper members are brought into contact with the base of the receptacle and the wheel is moved inwardly and rotated around to lie flat against the base.

It is to be appreciated that the base of the wheelbarrow may also be relieved of material. In this embodiment, the wheelbarrow would be provided with a sheet of rigid material for insertion into the framework to form the solid base by means of, for example, the lower members of the framework being provided with a flange for supporting the sheet. Alternatively, the framework could support a collapsible box, e.g., of reinforced cardboard, which is inserted into the framework prior to use and removed therefrom after use. The insert could be thrown out with, e.g., waste material loaded into the wheelbarrow or emptied and placed back for further use. The collapsible box may alternatively be of plastics material having fold lines in the form of living hinges to allow the box to be formed from a flat sheet of material.

Alternatively or additionally, the sides of the wheelbarrow may be formed of a rigid material which fold downwards onto the base of the receptacle for storage purposes. The sides may be provided with means for being fastened to the members of the framework, e.g., by the provision of clips or a hook and eye type fastener. Additional sheets of material may be provided for temporarily fastening to the sides of the receptacle to extend the height thereof thereby increasing the volume of the receptacle. The support legs of the barrow may also be

provided with wheels to assist in movement of the wheelbarrow, which may be permanently attached to the legs or detachable therefrom.

A wheelbarrow according to the present invention is particularly suitable for domestic use. Movement of the components into their non-operative position provides a compact wheelbarrow for easy placement eg., in the boot of a vehicle or for storage in a garden shed.

Figures 4 and 5 of the accompanying drawings illustrate a collapsible wheelbarrow according to an alternative embodiment of the present invention. The receptacle has been omitted from the drawings in order to show the details of the framework. The wheelbarrow 50 is comprised of a main framework for receiving a receptacle, a support leg, an attachment for mounting of a wheel and handles, the parts being hingedly, pivotally or slideably mounted with respect to one another to enable the wheelbarrow to be moved between an operative and a non-operative position.

In the illustrated example, the framework is made up of generally cylindrical members, for example of reinforced plastics material or metal, which are connected together, for example by the provision of complimentary male and female portions on the ends of each member. The framework has a planar rectangular main section 52 comprised of two parallel long members 52a, 52c connected at their ends by two parallel short members 52b, 52d by means of corner-tubing 53 thereby forming a mouth for receiving the receptacle of the wheelbarrow.

The wheel attachment has two parallel opposing side members 54 that are provided separate to the main planar section 52 of the framework, each side member abutting a part of the outer surface of a long member 52a, 52c of the main section and extending substantially

diagonally therefrom. The side members each have a free end 54a remote from the part that abuts the long member 52a, 52c with their other end 54b being hingedly connected to a handle 56 that, in the operative position, extends obliquely therefrom. A crossbar 58 is fixedly secured between the side members near to the free ends 54a thereof. A further connecting member 60 is rotatably mounted to the front short member 52d of the main planar section of the framework and extends to the cross bar 58. A wheel support 62 is rotatably attached to the connecting member 60 having a wheel 64 attached thereto.

The wheelbarrow 50 is also provided with a support leg in the form of a generally U-shaped member 66 comprising two parallel side members 66a connected by a base member 66b. Each side member 66a is hingedly attached at its free end to one of the long members 52a, 52c of the planar section of the framework and is also connected by means of an arm 68 to its respective handle 56.

The wheelbarrow 50 is movable between an extended, operative position (Figure 4) and a retracted, storage position (Figure 5). In the extended position, the free ends of the side members are spaced apart from the main planar section 52 by extending the handles 56 away from the side members and the wheel support is rotated outwardly from the centre of the framework such that the wheel is able to contact the ground. Extension of the handles outwardly from the side members also causes the support leg 66 to be brought to its extended position due to the presence of the arm 68. A receptacle, such as a collapsible box (not shown) is then inserted through the mouth, formed by the planar section 52, the receptacle having a peripheral rim that overhangs the framework of the main section to retain the box in position.

Conventional locking means are provided over the moveable parts of the apparatus to maintain the wheelbarrow in its extended state.

The various parts of the wheelbarrow may be retracted into a compact unit for storage purposes by bending the handles 56 inwardly to abut side members 54. This also causes the support leg 66 to move inwardly towards the planar section 52 of the framework and allows the connecting member 60 to be pivoted about the short member 52d such that the side members 54 move inwardly towards the planar section of the framework. The wheel support may also be rotated about the connecting member 60 such that the wheel is moved into a retracted position.

Figure 6 of the accompanying drawings illustrates yet a further embodiment of the present invention. The wheelbarrow 70 again has a framework of moveable parts which allow the main body of the barrow to be moved between an operative and non-operative position. In the illustrated embodiment, the main planar section 72 of the framework for receiving a receptacle is made up of a continuous piece of tubing, comprising two parallel long sections 72a, 72c connected at each end by two parallel short sections 72b, 72d. The intended rear corners of the barrow are each provided with a projection 74 in the form of sockets for receiving detachable handles 76.

Two extensions 80, 90 are attached to the planar section 72, one being a support leg 80 and the other 90 being for attachment of the wheel to the barrow. The support leg 80 is a generally U-shaped member formed of two side members 80a, 80c and a base member 80b, the side members each being connected at their free ends to one of the long sections 72a, 72c of

the planar section by means of a swivel joint 82. The central region of the base is preferably indented (as shown in Figure 6) to provide feet 84 for supporting the wheelbarrow.

A further extension 90 also extends from the swivel joint 82, being slidably mounted with respect to the planar section 72. The extension is also in the form of a generally U-shaped member comprising two parallel side members 90a, 90c that are attached to the planar section at the swivel joint and a base member 90b. The side members, in the operative position, extend substantially diagonally from the planar section. Two cross bars 96, 98 are rotatably mounted to the base member 90b, by means of swivel joints. One cross bar 96 extends from the base member and is rotatably mounted on the front short section 72b of the planar section and the other 98 is rotatably mounted on the base member of the support leg 80. A wheel 110 connected to a wheel support 112 may be rotatably mounted to the crossbar 96, as illustrated in Figure 7, having means 114 to prevent rotation of the support when the wheelbarrow is in use.

The wheelbarrow 70 may be extended to an operative position by pushing the support leg 80 and attachment 90 outwardly to their extended positions. The extended framework is locked in position by conventional locking means. A receptacle (not shown) may then be inserted through the planar section, the receptacle having a peripheral rim that overhangs the planar section to prevent the receptacle falling through the framework. Alternatively, suitable fastening means may be provided for attaching the receptacle to the frame. After use, the wheelbarrow may be stored away as a compact unit by removing the receptacle, unfastening the locking means, pushing the extensions 80, 90 inwardly towards the main section (as illustrated by the arrows in Figure 6) and detaching the handles from the sockets 74.

CLAIMS

1. A wheelbarrow comprising a receptacle, a handle extending from said receptacle, a wheel and a support leg wherein at least one of said parts is movable between an operative and a non-operative position.

2. A wheelbarrow as claimed in claim 1, wherein the receptacle comprises a base having sides extending upwardly therefrom.

3. A wheelbarrow as claimed in claim 2, wherein the sides of the receptacle are collapsible against the base thereof.

4. A wheelbarrow as claimed in claim 3, wherein the sides are made up of a framework of articulated members, being pivotally connected to each other to allow the sides to be flattened against the base of the barrow.

5. A wheelbarrow as claimed in claim 4, wherein each member is pivotable over a limited range of degrees, the extremes of which correspond to the operative and non-operative positions of the members respectively.

6. A wheelbarrow as claimed in claim 4 or 5, wherein each side is formed from two members extending upwardly from one side of the base being joined together at their upper end by a cross member.

7. A wheelbarrow as claimed in any one of claims 4 to 6, wherein the base is also formed as part of the framework, having a sheet of rigid material for insertion into the extended framework and being supported thereby for forming the base of the receptacle.

8. A wheelbarrow as claimed in any one of claims 4 to 7, wherein the support leg is formed as part of the framework, comprising a member that is pivotally attached to the base or a part of the framework.

9. A wheelbarrow as claimed in claim 8, wherein a crossbar is provided substantially diagonally between the support leg and the receptacle.

10. A wheelbarrow as claimed in claim 9, wherein the crossbar is formed of two parts, being pivotally mounted with respect to each other and having means for temporarily locking the two parts in one plane.

11. A wheelbarrow as claimed in any one of claims 4 to 10, wherein the sides are infilled by the provision of a fabric material between the members and the base of the wheelbarrow.

12. A wheelbarrow as claimed in any one of claims 4 to 10, wherein each side is provided with a separate sheet of material which may be fastened to the members.

13. A wheelbarrow as claimed in any one of claims 4 to 10, wherein a collapsible box is inserted into the framework for forming the base and/or sides of the receptacle.

14. A wheelbarrow as claimed in any one of claims 1 to 3, wherein the barrow has a framework for receiving the receptacle, a support leg and an attachment for the wheel, the framework, support leg and attachment being movable with respect to each other between the operative and non-operative positions.

15. A wheelbarrow as claimed in claim 14, wherein the support leg is hingedly connected to the framework.

16. A wheelbarrow as claimed in claim 14, wherein the support leg is pivotally connected to the framework.

17. A wheelbarrow as claimed in any one of claims 14 to 16, wherein the support leg is generally U-shaped comprising parallel side members being joined by a base member, the free ends of each side member being connected to the framework.

18. A wheelbarrow as claimed in any one of claims 14 to 17, wherein the attachment for the wheel is in the form of U-shaped member movable with respect to the framework, the base of the member having a crossbar mounted thereon for attachment of the wheel, the crossbar being pivotally mounted with respect to said framework.

19. A wheelbarrow as claimed in any one of claims 14 to 18, wherein the support leg and the wheel attachment are pivotally mounted with respect to each other.

20. A wheelbarrow as claimed in any one of claims 14 to 19 wherein a collapsible box is inserted into the framework for forming the receptacle.

21. A wheelbarrow as claimed in any one of claims 4 to 20 wherein the handle is formed as an extension to the framework, being provided with a joint at or near the junction with the receptacle.

22. A wheelbarrow as claimed in claim 21, wherein the handle is linked to the support leg whereby movement of the handle causes a corresponding movement of the support leg.

23. A wheelbarrow as claimed in any one of claims 1 to 20, wherein the handle is detachable.

24. A wheelbarrow as claimed in any one of the preceding claims wherein the wheel of the barrow is attached to a wheel support frame that is rotatably mounted to the framework or the receptacle.

25. A wheelbarrow as claimed in claim 24, wherein the support frame is provided with a locking mechanism to lock the support frame in the extended position.

26. A wheelbarrow as claimed in claim 24 or claim 25 wherein the support frame is spring loaded with respect to the receptacle or framework.

27. A wheelbarrow as claimed in any one of claims 1 to 23, wherein the wheel is detachable for storage purposes.

28. A wheelbarrow as claimed in any one of claims 4 to 27 wherein locking means are provided for locking the framework in the operative position.

29. A wheelbarrow as claimed in any one of the preceding claims, wherein the receptacle is provided with tapered sides.

30. A wheelbarrow as claimed in any one of the preceding claims wherein the sides of the receptacle are provided with detachable extensions thereto for temporarily extending the volume of the receptacle.

31. A wheelbarrow substantially as hereinbefore described and with reference to Figures 1 to 3, Figures 4 to 5 and Figure 6 to 7 of the accompanying drawings.

The Patent Office

INVESTOR IN PEOPLE

Application No:	GB 9917046.6	**Examiner:**	Peter Macey
Claims searched:	1 - 31	**Date of search:**	10 November 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B7B (BTW)

Int Cl (Ed.6): B62B 1/18, 1/20

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	WO 92/12035 A1	(PHAROAH) see figures 3a - d	1, 2, 29
X	US 5222757	(MAGYAR) see particularly figure 1	1 - 3
X	US 4781396	(KING) see all figures	1 - 5, 8, 29
X	US 4669743	(TIPKE) see figures 1 and 2	1, 2
X	US 4401313	(FILAS) see especially figure 8	1, 2, 29
X	US 4261596	(DOUGLAS) see especially figures 7A - E	1 - 5, 7, 8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.